

How to manage the cuff at vaginal hysterectomy

The high McCall culdoplasty and its modifications can prevent apical prolapse and enterocele

CASE 1 What procedures should accompany hysterectomy?

A.E., 44, mother of one, complains of heavy irregular bleeding with no sensation of a vaginal bulge. She has tried oral contraceptives, but they did not improve her bleeding pattern. She also has undergone dilatation and curettage and hysteroscopy (benign findings), also with no improvement.

Examination reveals a 9- to 10-week-size fibroid uterus, which is confirmed by ultrasonography. Pelvic support appears to be excellent.

After a discussion of the options, the patient elects to undergo vaginal hysterectomy. Are other procedures warranted?

Ask a gynecologic surgeon to name the most significant challenges he or she faces, and the answer is likely to include preventing pelvic organ prolapse after surgical intervention. Approximately one third of operations for pelvic organ prolapse involve patients whose prolapse has recurred after previous surgery.¹ Although we have advanced our understanding of the anatomy of pelvic support and the pathophysiology of support defects, the various surgical strategies remain largely untested and unproven.

Even women with good pelvic support who are undergoing hysterectomy—like the patient described above—are vul-

nerable. One particular area of concern: the risk of enterocele or vaginal apical prolapse, or both, after hysterectomy. In this article, I describe a technique to reduce the risk of these defects after vaginal hysterectomy: high uterosacral suspension, or modified McCall culdoplasty.

Enterocele and apical prolapse do not always coexist

Enterocele and apical prolapse are distinct entities. The latter represents a deficiency in the level I supporting structures described by DeLancey²—primarily the uterosacral and cardinal ligaments (FIGURE 1). Enterocele, or peritoneocele, is a herniation of the cul-de-sac peritoneum, with or without intestinal contents. In women who have undergone hysterectomy, enterocele is usually caused by a lack of continuity of level II fibers, namely, the failure to approximate the pubocervical and rectovaginal connective tissues at the time of hysterectomy.³ Careful attention to the vaginal cuff and cul-de-sac at the time of hysterectomy is therefore imperative.

The McCall culdoplasty: 50 years “young”

In 1957, Milton McCall, MD, described a technique to manage the cul-de-sac at the time of vaginal hysterectomy.⁴ The

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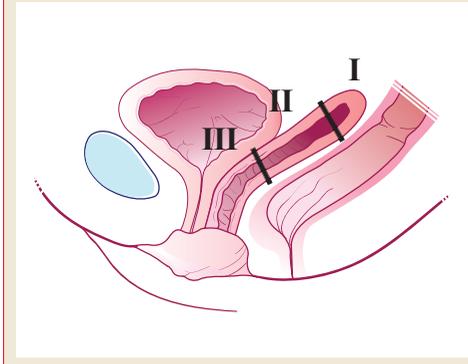
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FIGURE 1

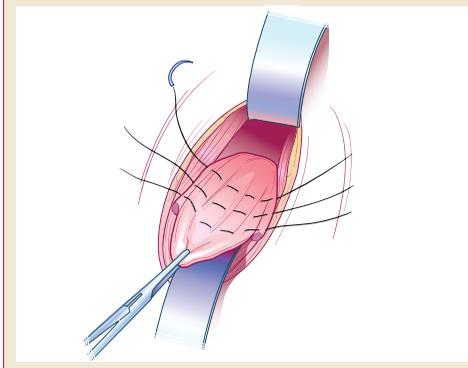
Three levels of support



The endopelvic fascia of a posthysterectomy patient divided into DeLancey's biomechanical levels: level I—proximal suspension, level II—lateral attachment, and level III—distal fusion.

FIGURE 2

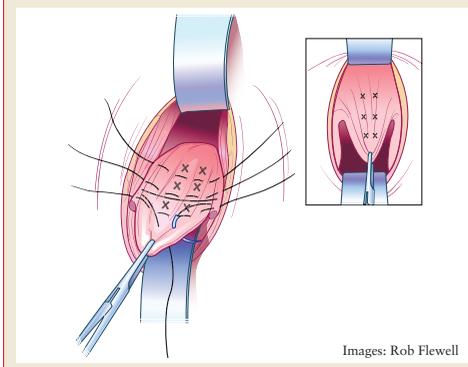
Internal McCall sutures



Traction on the most dependent portion of the cul-de-sac and posterior vaginal epithelium allows placement of 3 rows of sutures across the cul-de-sac from one uterosacral ligament to the other.

FIGURE 3

External McCall sutures



Images: Rob Flewell

Three additional rows of absorbable sutures incorporate vaginal epithelium and uterosacral ligaments to move the vaginal cuff superiorly.

FAST TRACK

The McCall technique for posterior culdoplasty omits dissection and excision of the hernia sac or excess cul-de-sac peritoneum

McCall technique of posterior culdoplasty differs from other approaches by omitting dissection and excision of the hernia sac, or excess cul-de-sac peritoneum. The original McCall culdoplasty begins with the placement of several rows (average of 3) of nonabsorbable suture (“internal” McCall sutures), starting at the left uterosacral ligament about 2 cm above its cut edge, and proceeding across the redundant cul-de-sac to terminate in the right uterosacral ligament. Each subsequent row is placed superior to the first, by applying traction to the previously placed sutures.

Prior to the tying of these sutures, 3 “external” absorbable sutures are placed. These sutures incorporate posterior vaginal epithelium, each uterosacral ligament, and the contralateral vaginal epithelium in a mirror image of the first pass through the vagina. Again, several rows are placed, each more superior to the last, to move the newly created vaginal apex to the highest point on the uterosacral ligaments once all the sutures are tied.

Tying the internal sutures not only creates a firm, shelf-like midline structure, but obliterates the redundant cul-de-sac. The external sutures move the vaginal apex to the uterosacral bridge and are tied at the conclusion of the procedure (FIGURES 2 and 3).

Modifications enhance durability and support

When the surgical indication is significant apical vaginal prolapse, the efficacy of the McCall procedure as both treatment and prevention is uncertain, because we lack adequate studies in this population. However, assuming that identifiable defects or breaks in the uterosacral ligaments lead to apical prolapse,³ use of the portion of the uterosacral ligament nearest the vagina appears unlikely to create a durable repair.

Thus, the concept of a “high” uterosacral attachment came to be proposed to provide a strong midline site of sup-

port for the vaginal apex.^{5,6} Further modifications include attachment of the uterosacral ligaments to pubocervical and rectovaginal connective tissues to create continuity of these level II fibers and prevent subsequent enterocele.⁷

With a high uterosacral attachment, the uterosacral ligaments need not be brought together in the midline.

Technique for modified approach

To locate each ligament, place traction on the vaginal apex toward the contralateral side. Palpate the pelvic structures posterior and medial to the ischial spines, at the 4 and 8 o'clock positions, to identify the strong tissue emanating from the sacrum.

Place several nonabsorbable sutures through the medial aspect of each uterosacral ligament, working from lateral to medial to minimize the risk of ureteral trauma. Then place 1 strand of each suture through the pubocervical and rectovaginal connective tissues. Tie the sutures to move the vaginal apex to the proximal segment of the uterosacral ligament (near the sacrum) and establish continuity of the pubocervical and rectovaginal connective tissues (FIGURES 4–6).

Main concern is ureteral injury

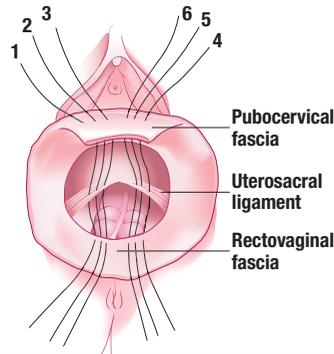
The ureter lies near the anterior margin of the uterosacral ligament, with a mean distance of 4.1 ± 0.6 cm at the level of the sacrum and 2.3 ± 0.9 cm at the level of the ischial spine.⁸ In 1 series of high uterosacral ligament suspension with site-specific endopelvic fascia defect repair, ureteral complications occurred in 11% of patients.⁵ Other series have reported rates of ureteral trauma in the range of 0.7%⁹ to 2.4%.⁶

Evaluate ureteral patency

After performing this procedure, the surgeon should ensure ureteral patency. For this reason, I believe that only surgeons skilled in cystoscopy and able to treat ureteral injury (or with ready access to those capable of treating this complication) should undertake high uterosacral suspension.

FIGURE 4

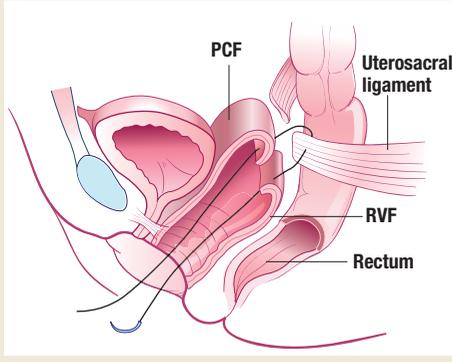
Suture placement is bilateral



Three sutures are placed in the uterosacral ligament pedicles on each side, with 1 arm of each suture placed in the transverse portion of the pubocervical and rectovaginal fascia.

FIGURE 5

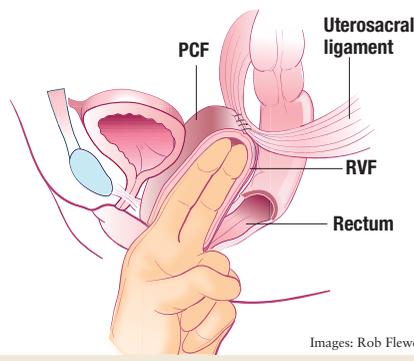
Suspensory suture



Sagittal view of a suspensory suture in left uterosacral ligament with 1 arm through pubocervical fascia (PCF) and 1 arm through rectovaginal fascia (RVF).

FIGURE 6

The suspended vaginal vault



Sagittal view of pubocervical fascia (PCF) and rectovaginal fascia (RVF) suspended from uterosacral ligaments.

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FAST TRACK

With high uterosacral attachment, the uterosacral ligaments need not be brought together in the midline

Integrating evidence and experience

How the McCall procedure compares with other approaches

Cruikshank SH, Kovac SR. Randomized comparison of three surgical methods used at the time of vaginal hysterectomy to prevent posterior enterocele. *Am J Obstet Gynecol.* 1999;180:859–865

Although many techniques and modifications have been described for management of the cul-de-sac and vaginal cuff, few comparative data exist. In McCall's original series,⁴ 43 patients undergoing vaginal hysterectomy with posterior culdoplasty were followed for a minimum of 3 months and a maximum of 3 years. Mean and median lengths of follow-up were not provided, nor were the indications for hysterectomy or the method of assessing the patient for recurrent defects. McCall reported that no patients developed an enterocele after the surgery.

The first and only randomized study

Cruikshank and Kovac performed the only prospective, randomized comparison of procedures used at the time of hysterectomy to prevent enterocele. In their study, 100 patients undergoing vaginal hysterectomy for various indications (excluding prolapse of the posterior superior segment of the vagina) were randomized to 1 of 3 surgical methods to prevent enterocele:

- **Moschcowitz-type closure** (n = 33), in which the peritoneum was closed using a purse-string technique, incorporating the distal ends of the uterosacral and cardinal ligaments and thereby drawing these structures to the midline
- **modified McCall culdoplasty** (n = 33), in which a higher purse-string closure of the peritoneum was performed superior to the "yellow fat line," incorporating the uterosacral-cardinal ligament complex (thus drawing these structures to the midline) and including the vagina (similar to the external McCall sutures) to move the apex superiorly
- **simple closure of the peritoneum** with a purse-string suture (n = 34), with none of the uterosacral-cardinal ligaments incorporated into the repair.

All procedures were performed by Cruikshank or Kovac, and all postoperative examinations were performed by the authors.

Three years of follow-up

Of the 100 patients, 98 were followed with serial examinations for 3 years, and the outcomes at all vaginal segments were documented, with particular attention to the posterior superior segment, using staging from the Pelvic Organ Prolapse Quantification (POP-Q) system.¹⁰

McCall procedure was most effective

Overall, 11 patients (11.2%) were found to have stage II prolapse of the posterior superior vagina, none of them in the McCall group. An additional 14 patients (14.3%) had stage I prolapse, with only 2 (2%) of these in the McCall group.

The McCall repair was significantly more effective than the other 2 types of repair, with a 6.1% risk of subsequent prolapse, versus 30.3% in women who had a Moschcowitz-type closure and 39.4% in those who underwent simple closure of the peritoneum. No patients in any group had prolapse greater than stage II at follow-up.

Limitations of the study

Although Cruikshank and Kovac designed their study to analyze appropriate prophylaxis against enterocele in patients without prolapse, several patients did have some form of prolapse—although it was unrelated to the posterior superior vagina. Therefore, several patients underwent concomitant reconstructive procedures that included: anterior colporrhaphy (13), posterior colporrhaphy (4), sacrospinous ligament fixation (3), bilateral paravaginal repair (10), and anti-incontinence procedures (10).

It is not clear which groups these patients fell into and whether the distribution was similar across all groups.

FAST TRACK

Patients undergoing McCall repair had a 6.1% risk of prolapse, versus 39.4% for simple closure of the peritoneum and 30.3% for Moschcowitz-type closure

CONTINUED

CASE 2 Is McCall procedure appropriate?

B.D., 57, complains of increasing pelvic pressure and a noticeable vaginal bulge. Her 2 children were delivered vaginally, the largest weighing 8 lb. B.D. reports that she remains sexually active.

Physical examination reveals the cervix to be at the level of the introitus, but it descends 2 cm beyond the introitus when the patient performs the valsalva maneuver. Although there is also some descent of the anterior and posterior vaginal walls (1 cm superior to the hymen with strain; Pelvic Organ Prolapse Quantification [POP-Q] value = -1), the predominant component of prolapse is an elongated cervix. The posterior vaginal fornix (POP-Q point D), representing apical support, descends to 7 cm superior to the hymen with strain, with a total vaginal length of 9 cm.

At surgery, the uterosacral ligaments do not appear to be attenuated. After vaginal hysterectomy, the apex of the vaginal vault is superior to the level of the ischial spines.

How do you proceed?

Given the relatively good support at the apex, this patient is a good candidate for a McCall-type culdoplasty. Whether or not this procedure will be truly pro-

phylactic (because there is already some descent of the apex, albeit mild) is perhaps only a matter of semantics. ■

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